

Control Of Erwinia Amylovora Fireblight Disease On Apple Trees Using Maryblyt Program In Albania

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ABSTRACT : Fireblight is a bacterial disease caused by *E.Amylovora* bacteria. It destroys vegetative measure, branches or the whole tree, which fades, dries out within a few days. In this study we used Maryblyt forecasting system, which has identified the most dangerous periods of infection by enabling necessary treatment time, and reducing the possibility of getting disease. To achieve this we have used daily data such as: maximum and minimum temperatures, relative humidity of the air, precipitation, atmospheric events (fog,dew,strong winds) and phenological events of the hosting plant, apple: silver tip, green tip, pink, blooming and petals fall. Based on these we defined: activation of the initial inoculate from wintering cancers, blossom blight and shoot blight.

Keywords - Fireblight, *Erwinia amylovora*, Maryblyt program.

INTRODUCTION

Fireblight caused by the bacterium *Erwinia amylovora* (Burrill) Winslow et al, is the most serious and complicated disease to fight in pome fruits. Fireblight destroys vegetative measure, branches or the whole tree, which fades, dries out within a few days (Kaltani and Çelo, 1982). This disease is most destructive in pear, apple and quince, affecting flowers, sprouts, and sometimes all the tree branches. Fireblight affects about 200 plant species in 40 genres of the Rosaceae family, where in addition to fruit trees is also seen in some ornamental plants of economic value. Albania's geographical position presents favorable conditions for the growth of fruit trees, among which the pome trees occupy an important place. Therefore the fight against fireblight in reality is difficult. Different chemicals combined with agritechincs measures has been used to control this disease, such as : shearing of the affected parts, stopping excessive growth of the tree, reducing nitrogen fertilization etc. Adapting Maryblyt forecasting system to this study, we aimed to determine the most critical treatment time, accompanying sanitation measures to take off the affected parts of the tree by winter cancers.

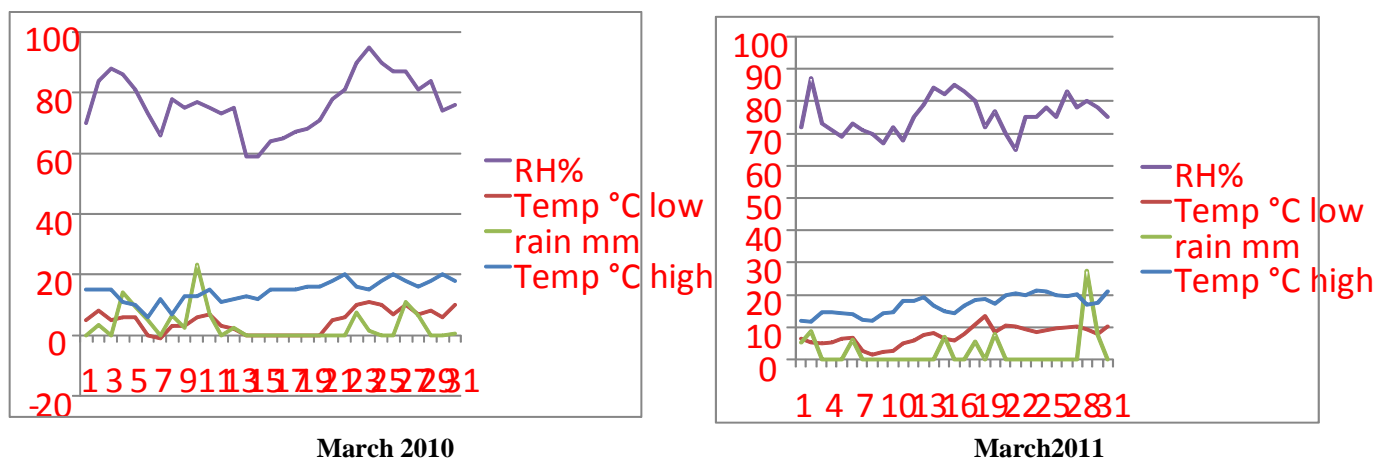
MATERIALS AND METHODS

The study was conducted over two years 2010-2011 in an seven years apple orchard, infected naturally by the disease. This orchard is located in Zhurie village on the periphery of Tirana, about 15 - 20 km to the east of the Adriatic Sea. During this study we have followed phenological stages of apple (cv Gala) which is very sensitive to the fireblight. In addition we have recorded climatic conditions: the maximum and minimum temperatures, rains in mm, relative air humidity in%, and atmospheric events such as: dew, fog, storm etc.. Determination of potential periods of risk is made on the basis (degree days) DD temperature above 12.7°C, which is considered as the lowest limit to develop a pathogen infection. Based on observations on infection in orchards have set activating inoculate, blossom blight and shoot blight.

DISCUSSION OF THE RESULTS

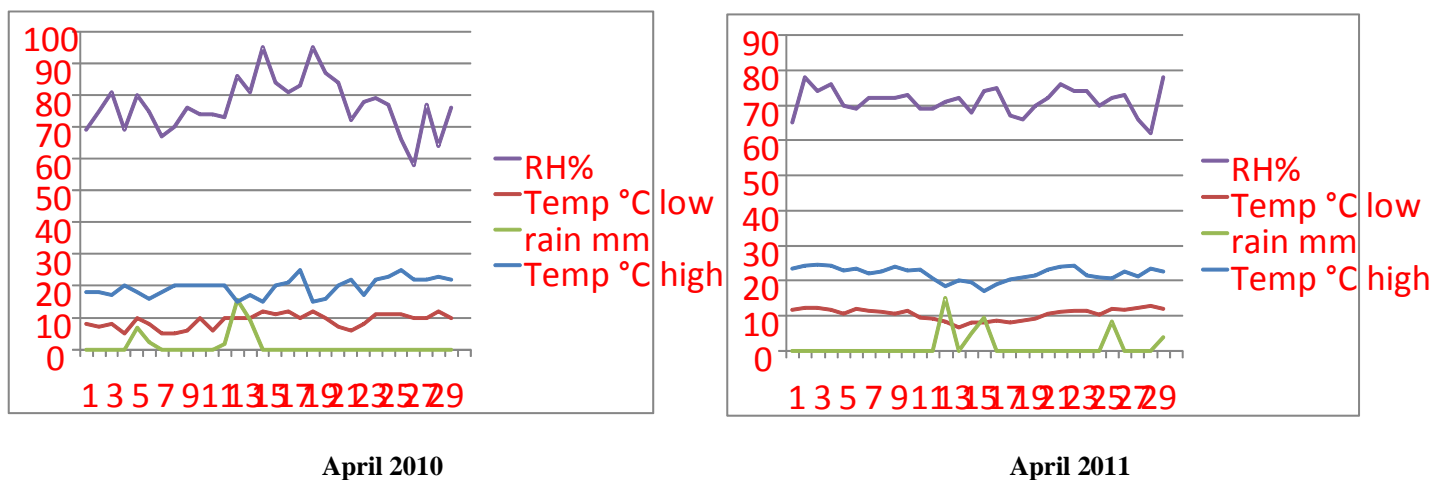
Obtained plants in this study are naturally infected by the disease, developing clear symptoms on branches and sprout. By periodic observations of the orchard and weather data, we concluded that apple (cv Gala) got off the silence and resumed winter vegetation achieving the silver tip on 21 - 27 March respectively 2011 and 2010

Graf 1 - Climatic conditions of the vegetative resumption



The green tip stage (green tip) was registered on 2 April 2010 and 30 March 2011.

Graf 2 – Climatic conditions of the green tip development



After we registered and calculated effective temperatures above 12.7°C and seeing the state of wintering cancers, showed that pathogen *Erwinia amylovora* was activated in flabby tissues wintering cancers when they were collected 52.7°C (DD) and 54.0°C (DD) from green tip stage for two years. This moment occurrence dates 10.04 and 04.04. On April 10 2010 apple trees were in the pink stage and 1 - 2 days later started blooming, while in 2011, activation of the inoculate prepared occurred on the same day as the start of pink stage and 6 days later began blooming. The disease is favored by atmospheric conditions such as fog, storm, up to two years. The inoculate used for infecting sensitive organs of the plant was activated on 10 April 2010 in phenological stage pink, a day before the start of blooming in active temperature 52.7°C (DD) above 12.7°C at a relative humidity to the air 74%. Regarding to 2011, inoculate was activated on 4 April 2011 at the phenological stage pink, 6 days before the start of the blooming in active temperature 54°C (DD) at a relative humidity to the air 76%. By continuing registration of weather conditions, we determined that the 2010 flowers were affected on 20 April (end of blooming) when they were collected 57°C DD (above 12.7°C) by inoculate. Regarding to 2011, symptoms appeared on the day of blooming on 10 April when they were collected 57 DD° (above 12.7°C) by inoculate, Scion disease symptoms appeared on 27 April 2010 when supplemented by active temperature 119.1°C (DD) (above 12.7°C) from inokuli ready, when the apple trees on fruit and petals are starting to fall and in 2011 was featured on 18 April when it was completed active temperature of 118.5°C (DD) (above 12.7°C)

from inoculate at the time of the end to the flourishing and falling petals. Given the above data, we can conclude that these are the most important moments when the plant can get infected by the disease.

CONCLUSION

Through the use of Maryblyt system, we came to the determination of the most dangerous moments of fireblight disease (*E.amylovora*).

Year 2010:

1. Initial inoculate appeared pink in 52.7°C temperature DD (above 12.7°C) from green tip stage on 10.04.
2. Blossom blight appeared at the end of the blooming ,in 109.7°C temperature DD (above 12.7°C) from green tip on 20.04.
3. Shoot blight appeared after the post bloom (Increasing of fruit size) at temperatures 171.8°C DD (above 12.7°C) from green tip stage on 27.04.

Year 2011:

1. Inoculate initial stage appeared pink in 54°C DD (above 12.7°C) from green tip stage on 04:04.
2. Blossom blight appeared on the day of blooming in 116°C DD temperatures (above 12.7°C) from green tip stage on 10.04.
3. Shoot blight infection appeared at the end of the booming and petals fall in 172.9°C DD (above 12.7°C) from green tip on 18.04.

We conclude that these are the most dangerous periods of infection, and the most appropriate moments for the application of treatments on apple trees, by associating these sanitary measures, removing affected parts of the tree.

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The use of forecasting MARYBLYT program for the determination of infection risks from fireblight (*Erwinia amylovora*) disease on pome fruits.